CLAIMS

1. An image intensifier comprising:

an optical splitter operable to split radiation received from a radiation source into a plurality of optical channels;

a gated optical image intensifier having a plurality of image intensifying channels operable to intensify radiation received from a respective one of said plurality of optical channels; and

an electronic gating signal generator operable to generate independent time gating signals applied to respective ones of said plurality of intensifying channels such that said plurality of intensifying channels intensify radiation received from said radiation source at different times.

2. An image intensifier as claimed in claim 1, wherein said gated optical image intensifier is a unitary device such that said plurality of image intensifying channels share common gain controlling parameters.

3. An image intensifier as claimed in any one of claims 1 and 2, wherein said gated optical image intensifier includes a photocathode divided into a plurality of separately gated radiation receiving areas.

4. An image intensifier as claimed in claim 3, wherein said plurality of separately gated radiation receiving areas are divided from each other by resistive strips so as to provide ac electrical separation therebetween.

5. An image intensifier as claimed in any one of claims 3 and 4, wherein said gated image intensifier includes a gating signal electrode disposed adjacent said photocathode, said gating signal electrode being divided into a plurality of electrode portions indexed with respective ones of said plurality of separately gated radiation receiving areas and operable to couple a gating signal thereto.

6. An image intensifier as claimed in any one of the preceding claims, wherein said electronic gating signal generator is triggered to generate said independent time of gating signals by a shared trigger signal.

7. An image intensifier as claimed in any one of the preceding claims, wherein radiation source comprises an object illuminated by a pulsed laser source.

8. An image intensifier as claimed in claims 6 and 7, wherein said shared trigger signal is synchronised with said pulsed laser source.

9. An image intensifier as claimed in any one of the preceding claims, wherein said plurality of intensifying channels are operable to intensify fluorescence radiation received from an object at respective times following excitation of fluorescence in said object so as to perform fluorescence lifetime imaging.

10. An image intensifier as claimed in claim 9, wherein said optical splitter divides fluorescence radiation from said object in proportions such that those optical channels corresponding to intensifying channels that are gated to intensify later in said time gating sequence receive more of said fluorescence radiation.

11. An image intensifier as claimed in claim 10, wherein said fluorescence radiation is divided between said optical channels in proportions such that given an expected fluorescence lifetime decay characteristic each intensifying channel will receive an intensity of radiation whilst gated that is substantially constant between intensifying channels.

12. An image intensifier as claimed in any one of the preceding claims, wherein said optical splitter and said gated optical image intensifier each both comprise three or four channels.

13. An image intensifier as claimed in any one of the preceding claims, wherein said image intensify is operable to perform one of:

fluorescence correlation spectroscopy;
imaging through diffuse media;
image physiological electrical signals;
endoscopic imaging; and
histopathological imaging.

14. A method image intensification, said method comprising the steps of:

splitting radiation received from a radiation source into a plurality of optical channels with an optical splitter;

intensifying radiation received from said plurality of optical channels within respective ones of a plurality of intensifying channels of a gated optical image intensifier; and

generating independent time gating signals applied to respective ones of said intensifying channels such that said plurality of intensifying channels intensify radiation received.

15. A method as claimed in claim 14, wherein said gated optical image intensifier is a unitary device such that said plurality of image intensifying channels share common gain controlling parameters.

16. A method as claimed in any one of claims 14 and 15, wherein said gated optical image intensifier includes a photocathode divided into a plurality of separately gated radiation receiving areas.

17. A method as claimed in claim 16, wherein said plurality of separately gated radiation receiving areas are divided from each other by resistive strips so as to provide ac electrical separation therebetween.

18. A method as claimed in any one of claims 16 and 17, wherein said gated image intensifier includes a gating signal electrode disposed adjacent said photocathode, said gating signal electrode being divided into a plurality of electrode portions indexed with

respective ones of said plurality of separately gated radiation receiving areas and operable to couple a gating signal thereto.

19. A method as claimed in any one of claims 14 to 18, wherein a shared trigger signal triggers generation of said independent time gating signals.

20. A method as claimed in any one of claims 14 to 19, wherein radiation source comprises an object illuminated by a pulsed laser source.

21. A method as claimed in claims 19 and 20, wherein said shared trigger signal is synchronised with said pulsed laser source.

22. A method as claimed in any one of claims 14 to 21, wherein said plurality of intensifying channels are operable to intensify fluorescence radiation received from an object at respective times following excitation of fluorescence in said object so as to perform fluorescence lifetime imaging.

23. A method as claimed in claim 22, wherein said optical splitter divides fluorescence radiation from said object in proportions such that those optical channels corresponding to intensifying channels that are gated to intensify later in said time gated sequence receive more of said fluorescence radiation.

24. A method as claimed in claim 23, wherein said fluorescence radiation is divided between said optical channels in proportions such that given an expected fluorescence lifetime decay characteristic each intensifying channel will receive an intensity of radiation whilst gated that is substantially constant between intensifying channels.

25. A method as claimed in any one of claims 14 to 24, wherein said optical splitter and said gated optical image intensifier each both comprise three or four channels.

26. A method as claimed in any one of claims 14 to 25, wherein said image intensify is operable to perform one of:

fluorescence correlation spectroscopy;

imaging through diffuse media;

image physiological electrical signals;

endoscopic imaging; and

histopathological imaging.